Surface Mount ESD Capability Rectifier

eSMP® Series



Top View **Bottom View**

MicroSMP (DO-219AD)



ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 200 V, 400 V, 600 V
I_{FSM}	20 A
V_F at I_F = 1.0 A	0.925 V
I_R	1 µA
T_J max.	175 °C
Package	MicroSMP (DO-219AD)
Circuit configuration	Single

FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT HALOGEN FREE

- Very low profile - typical height of 0.65 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop, low leakage current
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

General purpose, polarity protection, and rail-to-rail protection in both consumer and automotive applications.

MECHANICAL DATA

Case: MicroSMP (DO-219AD)
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	MSE1PB	MSE1PD	MSE1PG	MSE1PJ	UNIT
Device marking code		SB	SD	SG	SJ	
Max. repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Max. average forward rectified current (fig. 1)	$I_{F(AV)}$	1.0				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	20				A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175				°C

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Max. instantaneous forward voltage	I_F = 0.5 A	T_A = 25 °C	V_F (1)	0.940	-	V
	I_F = 1.0 A			1.016	1.1	
	I_F = 0.5 A	T_A = 125 °C		0.834	-	
	I_F = 1.0 A			0.925	0.98	
Max. reverse current	Rated V_R	T_A = 25 °C	I_R (2)	-	1.0	µA
		T_A = 125 °C		3.7	50	
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	780	-	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	5	-	pF

Notes
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**MSE1PB**	**MSE1PD**	**MSE1PG**	**MSE1PJ**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	110				°C/W
	$R_{\theta JL}$ (1)	30				
	$R_{\theta JC}$ (1)	40				

Note
(1) Thermal resistance from junction to ambient and junction to lead mounted on PCB with 6.0 mm x 6.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band.

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS (T_A = 25 °C, unless otherwise noted)					
STANDARD	**TEST TYPE**	**TEST CONDITIONS**	**SYMBOL**	**CLASS**	**VALUE**
AEC-Q101-001	Human body model (contact mode)	C = 100 pF, R = 1.5 kΩ	V_C	H3B	> 8 kV
AEC-Q101-002	Machine model (contact mode)	C = 200 pF, R = 0 Ω		M4	> 400 V
JESD22-A114	Human body model (contact mode)	C = 100 pF, R = 1.5 kΩ		3B	> 8 kV
JESD22-A115	Machine model (contact mode)	C = 200 pF, R = 0 Ω		C	> 400 V
IEC 61000-4-2 (2)	Human body model (contact mode)	C = 150 pF, R = 330 Ω		4	> 8 kV
	Human body model (air-discharge mode) (1)	C = 150 pF, R = 330 Ω		4	> 15 kV

Notes
(1) Immunity to IEC 61000-4-2 air discharge mode has a typical performance > 30 kV
(2) System ESD standard

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MSE1PJ-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel
MSE1PJHM3/89A (1)	0.006	89A	4500	7" diameter plastic tape and reel
MSE1PGHM3/I	0.006	I	16 000	13" diameter plastic tape and reel

Note
(1) AEC-Q101 qualified

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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

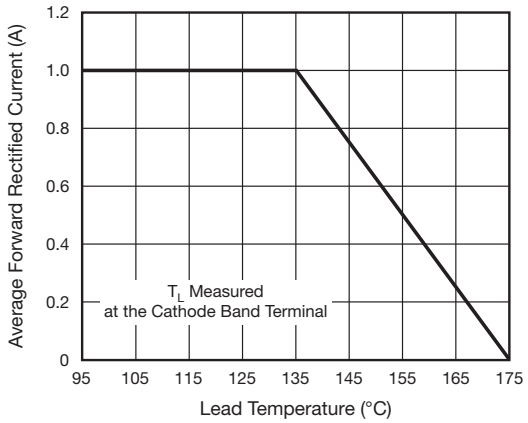

Fig. 1 - Forward Current Derating Curve

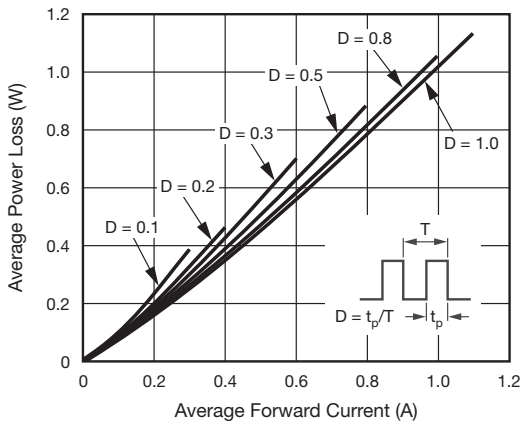

Fig. 2 - Forward Power Loss Characteristics

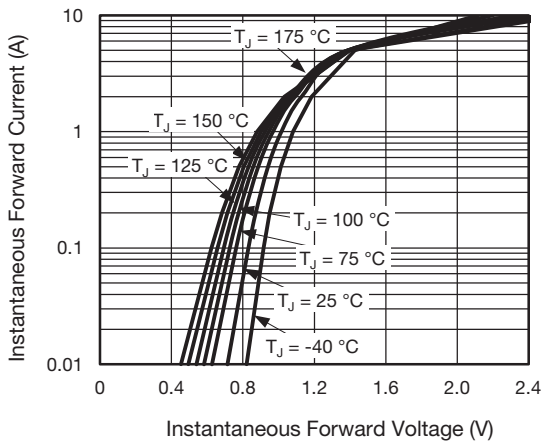

Fig. 3 - Typical Instantaneous Forward Characteristics

Fig. 4 - Typical Reverse Leakage Characteristics

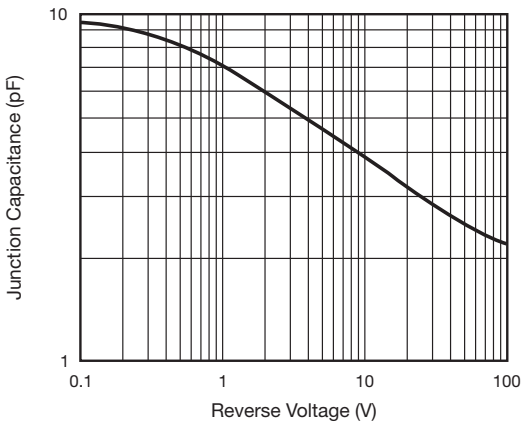

Fig. 5 - Typical Junction Capacitance

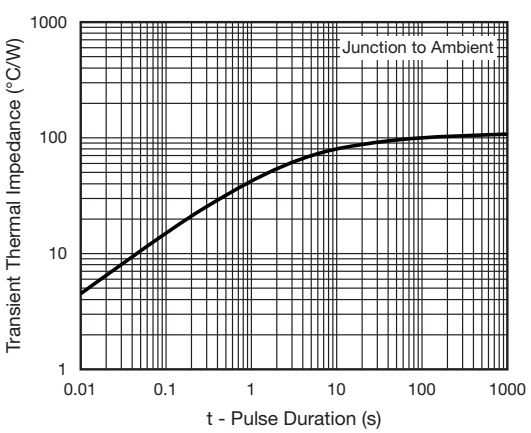

Fig. 6 - Typical Transient Thermal Impedance

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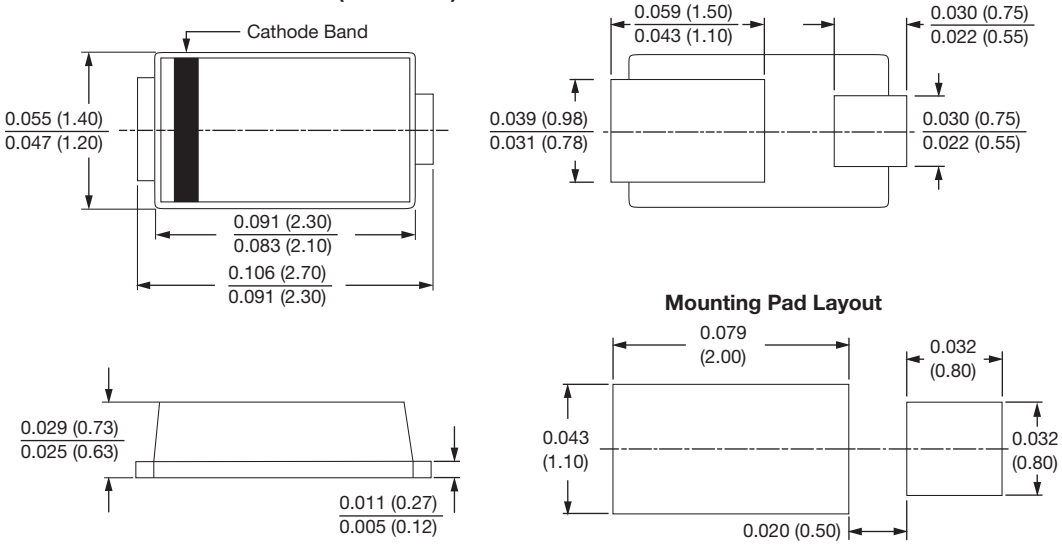
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

MicroSMP (DO-219AD)



Mounting Pad Layout

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